

Ultrasonic and postnatal findings in left visceral isomerism

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Summary: Sonographic and postmortem findings of left visceral isomerism associated with polysplenia are reviewed. Particular stress is given to pathologic data, which could prospectively suggest some specific ultrasonic features in order to characterize this complex syndrome.

Key words: Congenital heart disease; Laterality syndrome.

INTRODUCTION

The widespread availability and use of ultrasonic imaging equipment has increased the prenatal detection of a number of congenital structural defects; many a clinical decision is currently founded on sonographic diagnosis⁽¹⁾. It is therefore necessary to have an accurate postnatal control, which invariably adds information to the prenatal findings.

The Authors discuss the detection in utero of a severe congenital cardiopathy with hydrops foetalis, which was postnatally found to be part of a complex and rare syndrome.

CASE REPORT

A 23 year old primigravida, gestational age 33 weeks, was admitted to the hospital because

of pre-eclamptic toxemia and preterm labour. Doppler recording of foetal tones displayed continuous marked bradycardia (40 b.p.m.). On these grounds an ultrasonic scan was immediately performed. The findings were: growth compatible with gestational age, massive abdominal ascites, skin oedema, no pleural or pericardial effusion. The lobes of the liver were symmetrically distributed on each side of a dilated umbilical vein (Fig. 1). The "4 chamber view" section of the foetal thorax was definitely abnormal⁽²⁾. The anterior ventricle was dilated and outlined by coarser and thicker walls (inner diastolic diameter: 17 mm on M-mode); the posterior one was extremely hypoplastic (inner diastolic diameter = 8 mm); the right atrium appeared distended. It was possible to clearly distinguish a single vessel originating from the anterior ventricle (Fig. 2).

The parents were counselled, on the grounds of a severe congenital heart disease suggesting poor prognosis. With their agreement, the mother was allowed to progress in labour and to have a vaginal delivery.

The neonate (birth weight of 3000 grams) looked massively hydropic, 1 minute Apgar score was 0 with faint cardiac activity.

After primary resuscitation a temporary improvement in the general condition was obtained. ECG showed evidence of complete atrio-ventricular dissociation and signs of right atrial enlargement (Fig. 3). The baby died one hour after birth.

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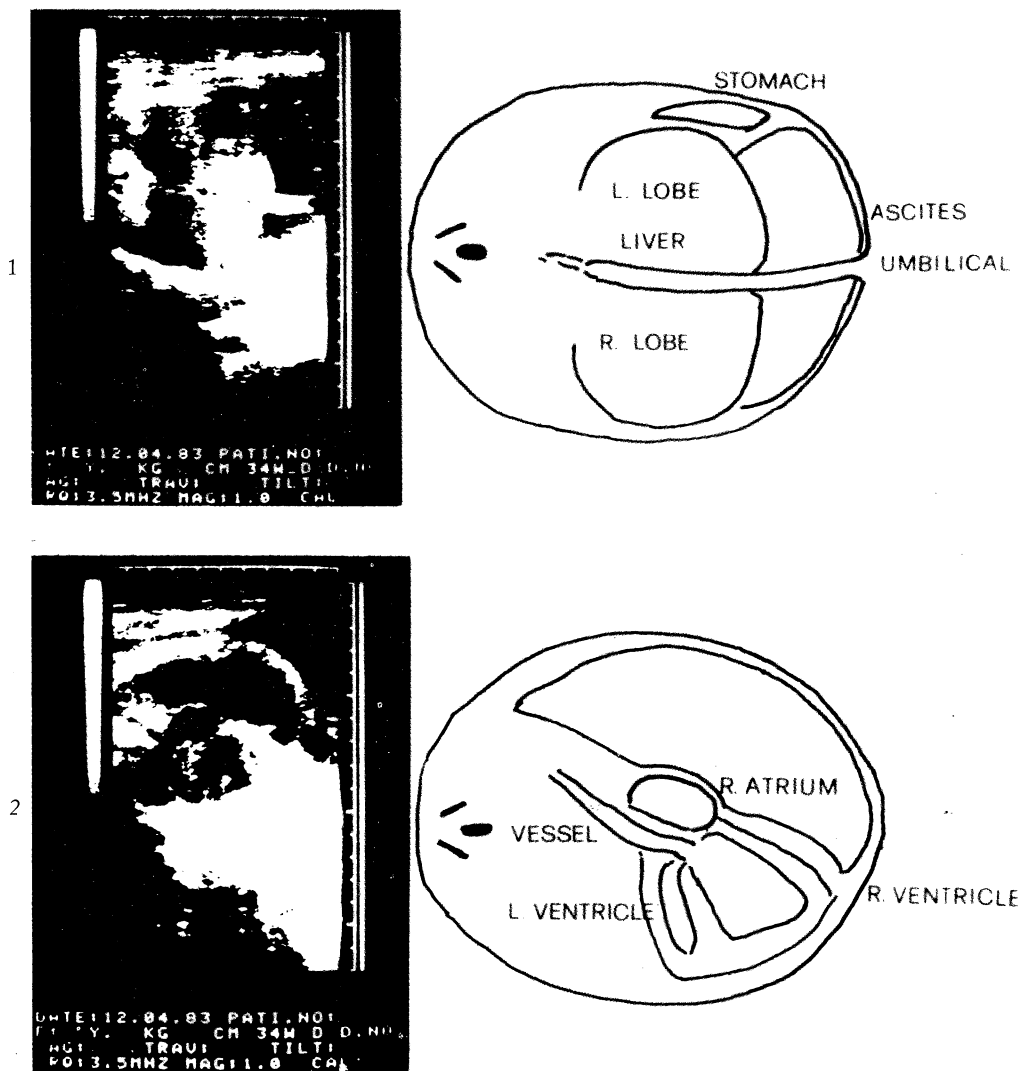


Fig. 1. — Transverse scan of fetal abdomen showing severe ascites and typical symmetrical distribution of the two lobes of the liver.

Fig. 2. — Transverse scan of fetal thorax, at the level of the cardiac chambers, where both right atrium and right ventricle are grossly dilated. Left ventricle is hypoplastic. One vessel is shown, coming out of the anterior chamber.

Autopsy findings were: heterotaxic abdominal visceral situs; symmetrical liver lobes, intestinal malrotation with common mesentery; spleen tissue distributed in two areas on the left hand side; bilobed lungs and left morphology on both sides of tracheo-bronchial tree, atrial situs of left isomeric type (Fig. 4), anomalous systemic venous return (2 superior venae cavae, 1 inferior vena cava interrupted and connected via left azygous vein); abnormal pulmonary vein connection; markedly hypoplastic left ventricle communicating via a small perimembranous ventricular septal defect with the right side (Fig.

present case was managed according to some clearcut ultrasonic findings the various features of a complex syndrome were displayed only by the postmortem examination⁽⁷⁾. Both right and left sidedness tend to be sporadic occurrences and therefore very occasionally present as a diagnostic problem during routine ultrasound. The Authors remark the importance of the unusual symmetrical distribution of the he-

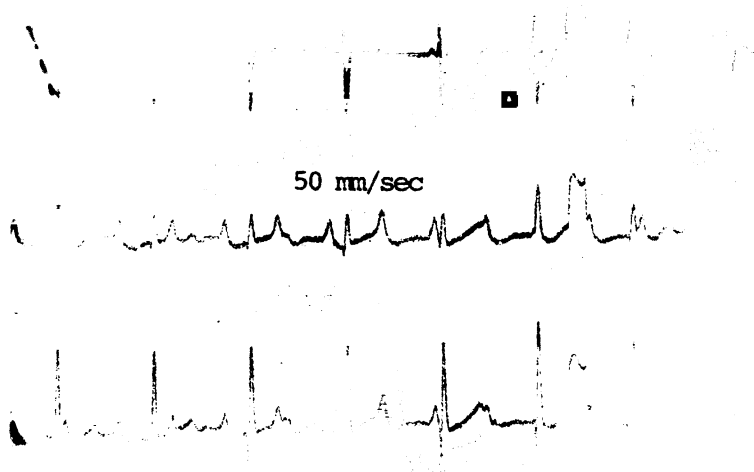


Fig. 3. — ECG showing complete atrio-ventricular block. Atrial rate 80/min. Ventricular rate 45/min. Right atrial enlargement.

5), both great arteries originating from the right ventricle, pulmonary artery bicuspid and stenotic, right sided aortic arch and aorta, left sided ductus. These features are diagnostic for left visceral isomerism.

DISCUSSION

The primary defect in sidedness disorders is a failure of normal asymmetry in morphogenesis. Among other differences, the spleen reflects the variant laterality (polysplenia in left sidedness, asplenia in right sidedness). Associated cardiac anomalies are usually more severe in bilateral right sidedness^(3, 4, 5, 6). Although the

patic lobes as an ultrasonic finding, which can, besides the cardiac abnormality, direct towards a correct diagnostic approach.

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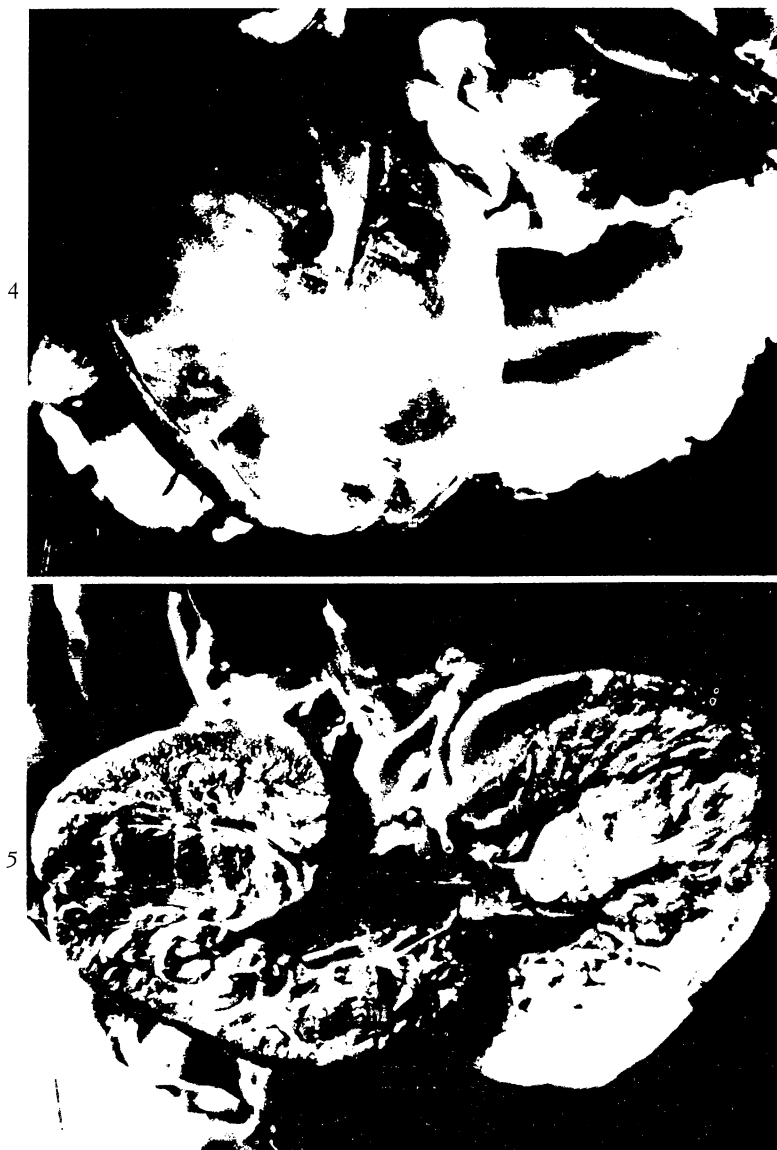


Fig. 4. — Anterior view of the heart. The aorta, anterior to pulmonary artery, is connected to the right ventricle.

Fig. 5. — Internal view of the heart. The heart has been cut in a way to show a « 4 chamber view » - like section.

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News

"AIUM CONGRATULATES THE 1991 AWARD RECIPIENTS"

Rockville, MD – The American Institute of Ultrasound in Medicine (AIUM) announces the AIUM 1991 Award recipients to be honored at the AIUM's 35th Annual Convention in Atlanta, Georgia.

The Memorial Hall of Fame Award honors the late Richard A. Banjavic, PhD, an esteemed medical physicist devoted to the field of ultrasound. Dr. Banjavic earned his BS degree in physics from The Johns Hopkins University and a MS in physics from the University of Illinois. He enrolled in Medical Physics at the University of Wisconsin where he completed his doctoral research in the distortion of ultrasound beams by soft tissues. Dr. Banjavic was a Fellow of the AIUM, a member of the AIUM Board of Governors, and served as Chairman of the Standards Committee, Manufacturers Commendation Panel, and Basic Sciences and Instrumentation Section. In addition, Dr. Banjavic joined the Radiological Sciences Division

at the University of Colorado, served as the Director of the Medical Physic Training Program at the University of Missouri, Columbia, and practiced as a radiation physicist at the John Cochran VA Medical Center in St. Louis. This award recognizes Dr. Banjavic's commitment to and excellence in the study of ultrasound medicine.

The Joseph H. Holmes, Clinical Pioneer Award honors Horace Edwards Thompson, MD. Dr. Thompson is a Visiting Clinical Professor in the Department of Obstetrics and Gynecology, Antenatal Testing Unit, at the University of Colorado Health Sciences Center. He served as President of AIUM and presently serves on the Archives and Bioeffects Committees and the editorial board of the *Journal of Ultrasound in Medicine*. In addition, Dr. Thompson is a Past-President of the World Federation of Ultrasound in Medicine and Biology (WFUMB), and presently serves as Chairman of WFUMB's Finance Committee, editor of the WFUMB New-

sletter, and member of WFUMB's Administrative Council.

Dr. Edwin Carstensen received the Joseph H. Holmes, Basic Science Pioneer Award. Dr. Carstensen is the Arthur Gould Yates Professor of Engineering (Emeritus) and Senior Scientist in Electrical Engineering at the University of Rochester, New York. Dr. Carstensen earned his MS in physics from the Case Institute of Technology in 1947, and obtained his PhD in physics from the University of Pennsylvania in 1955. He has written a number of chapters in books, journal articles and the book entitled *Biological Effects of Transmission Line Fields*. Dr. Carstensen is a Fellow of the AIUM, as well as the Acoustical Society of America, and the Institute of Electrical and Electronic Engineers, and a member of the National Academy of Engineering.

The William J. Fry Memorial Lecture honors D. Eugene Strandness Jr., MD. Dr. Strandness is a Visiting Professor at the University of Cincinnati, the Univer-

sity of Louisville, and the University of Toronto, and a Professor of Surgery at the University of Washington. He is a member of the AIUM Board of Governors, and the President of the Society for Vascular Surgery, and the Western Vascular Society. He is a published writer and serves on the editorial board of the *Journal of Vascular Medicine & Biology*, and the *Annals of Vascular Surgery*.

For more information on the 1991 AIUM Award Recipients, contact the AIUM Publications Department, 11200 Rockville Pike, Suite 205, Rockville, MD 20852-3139.

AIUM is an 8,500-member multidisciplinary society representing physicians, scientists, engineers, sonographers, and veterinarians involved with diagnostic ultrasound. With the help and support of their members and over 200 volunteers, AIUM has been able to promote the safe and effective utilization of ultrasound in clinical medicine for over 30 years.